

Claims

We claim:

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- 1 1. A method for providing a vertebrate animal with a therapeutically/  
2 effective amount of a protein, said method comprising introducing into cells of said  
3 animal an effective amount of a recombinant entomopox virus vector, wherein said  
4 vector comprises a polynucleotide encoding said protein.
- 1 2. The method according to claim 1, wherein said animal is a mammal.
- 1 3. The method according to claim 2, wherein said mammal is a human.
- 1 4. The method according to claim 1, wherein said vector comprises inverted  
2 terminal repeat sequences flanking said polynucleotide encoding said protein.
- 1 5. The method according to claim 4, wherein said inverted terminal repeat  
2 sequences are derived from adeno-associated virus.
- 1 6. The method according to claim 1, wherein said vector comprises a  
2 promoter sequence capable of driving expression of said polynucleotide encoding  
3 said protein.
- 1 7. The method according to claim 6, wherein said promoter sequence is  
2 selected from the group consisting of a CMV promoter sequence and herpes TK  
3 promoter sequence.
- 1 8. The method according claim 1, wherein said protein encoded by said  
2 polynucleotide is selected from the group consisting of interleukins, cytokines,  
3 growth factors, interferons, enzymes and structural proteins.

1           9. The method according to claim 1, wherein said vector is introduced into  
2 said cells of said animal by infection in a viral particle.

1           10. The method according to claim 1, wherein said vector is introduced into  
2 said cells of said animal by means selected from the group consisting of transfection,  
3 transduction and injection.

1           11. The method according to claim 1, wherein said vector is introduced into  
2 said cells of said animal *in vitro* and said treated cells are introduced into said animal.

1           12. The method according to claim 1, wherein said vector is introduced into  
2 said cells of said animal *in vivo*.

1           13. The method according to claim 1, wherein said polynucleotide encoding  
2 said protein is greater than about 10 kb in size.

1           14. The method according to claim 1, wherein said polynucleotide also  
2 encodes a selectable marker protein.

1           15. A recombinant entomopox virus vector comprising a polynucleotide  
2 encoding a protein capable of providing a therapeutic effect to an animal when  
3 expressed in said animal.

1           16. The recombinant vector according to claim 15, wherein said animal is a  
2 mammal.

1           17. The vector according to claim 16, wherein said mammal is a human.

1 18. The vector according to claim 15, wherein said entomopox virus is  
2 *Amsacta moorei*.

1 19. The vector according to claim 15, wherein said vector comprises inverted  
2 terminal repeat sequences flanking said polynucleotide encoding said protein.

1 20. The vector according to claim 19, wherein said inverted terminal repeat  
2 sequences are derived from adeno-associated virus.

1 21. The vector according to claim 15, wherein said vector comprises a  
2 promoter sequence capable of driving expression of said polynucleotide encoding  
3 said protein.

1 22. The vector according to claim 21, wherein said promoter sequences are  
2 selected from the group consisting of CMV and herpes TK.

1 23. The vector according to claim 15, wherein said protein encoded by said  
2 polynucleotide is selected from the group consisting of interleukins, cytokines,  
3 growth factors, interferons, enzymes and structural proteins.

1 24. The vector according to claim 15, wherein said polynucleotide encoding  
2 said protein is greater than about 10 kb in size.

1 25. The vector according to claim 15, wherein said polynucleotide also  
2 encodes a selectable marker protein.

1 26. A composition of matter comprising a recombinant entomopox vector,  
2 wherein said vector comprises a polynucleotide encoding a protein capable of  
3 providing a therapeutic effect to an animal when expressed in said animal, and

4 wherein said composition of matter is selected from the group consisting of viral  
5 particles and cells.

1 27. The cell according to claim 26, wherein said cell expresses a protein  
2 encoded by said polynucleotide.

1 28. An isolated polynucleotide encoding an *Amsacta moorei* entomopox  
2 virus protein selected from the group consisting of triacylglyceridelipase,  $\text{Cu}^{++}/\text{Zn}^{++}$   
3 superoxide dismutase, CPD photolyase, baculovirus-like inhibitor of apoptosis, first  
4 poly(A) polymerase small subunit, second poly(A) polymerase small subunit, first  
5 DNA polymerase, second DNA polymerase, ABC transporter-like protein, Kunitz-  
6 motif protease inhibitor and poly(A) polymerase large subunit.

1 ~~sub 2-3~~ 29. The polynucleotide according to claim 28, wherein said triacylglyceride  
2 lipase comprises SEQ ID NO: 12 or a fragment or variant thereof.

1 30. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 1 or a fragment or variant thereof.

1 31. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 1 or its complement.

1 ~~sub 2-4~~ 32. The polynucleotide according to claim 28, wherein said  $\text{Cu}^{++}/\text{Zn}^{++}$   
2 superoxide dismutase comprises SEQ ID NO: 13 or a fragment or variant thereof.

1 33. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 2 or a fragment or variant thereof.

1 34. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 2 or its complement.

1 sub 5 35. The polynucleotide according to claim 28, wherein said CPD photolyase  
2 comprises SEQ ID NO: 14 or a fragment or variant thereof.

1 36. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 3 or a fragment or variant thereof.

1 37. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 3 or its complement.

1 sub 6 38. The polynucleotide according to claim 28, wherein said baculovirus-like  
2 inhibitor of apoptosis comprises SEQ ID NO: 15 or a fragment or variant thereof.

1 sub 2 39. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 4 or a fragment or variant thereof.

1 40. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 4 or its complement.

1 sub 27 41. The polynucleotide according to claim 28, wherein said first poly(A)  
2 polymerase small subunit comprises SEQ ID NO: 16 or a fragment or variant thereof.

1 42. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 5 or a fragment or variant thereof.

1 43. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 5 or its complement.

8  
sub 2

1 44. The polynucleotide according to claim 28, wherein said second poly(A)  
2 polymerase small subunit comprises SEQ ID NO: 17 or a fragment or variant thereof.

1 45. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 6 or a fragment or variant thereof.

1 46. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 6 or its complement.

sub 2<sup>69</sup>

1 47. The polynucleotide according to claim 28, wherein said first DNA  
2 polymerase comprises SEQ ID NO: 18 or a fragment or variant thereof.

1 48. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 7 or a fragment or variant thereof.

1 49. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 7 or its complement.

sub 2<sup>70</sup>

1 50. The polynucleotide according to claim 28, wherein said second DNA  
2 polymerase comprises SEQ ID NO: 19 or a fragment or variant thereof.

1 51. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 8 or a fragment or variant thereof.

1 52. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 8 or its complement.

sub a<sup>11</sup>

1 53. The polynucleotide according to claim 28, wherein said ABC transporter-  
2 like protein comprises SEQ ID NO: 20 or a fragment or variant thereof.

1 54. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 9 or a fragment or variant thereof.

1 55. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 9 or its complement.

12  
sub a<sup>12</sup>  
1 56. The polynucleotide according to claim 28, wherein said Kunitz-motif  
2 protease inhibitor comprises SEQ ID NO: 21 or a fragment or variant thereof.

1 57. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 10 or a fragment or variant thereof.

1 58. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 10 or its complement.

sub a<sup>13</sup>  
1 59. The polynucleotide according to claim 28, wherein said poly(A)  
2 polymerase large subunit comprises SEQ ID NO: 22 or a fragment or variant thereof.

1 60. The polynucleotide according to claim 28, wherein said polynucleotide  
2 comprises SEQ ID NO: 11 or a fragment or variant thereof.

1 61. The polynucleotide according to claim 28, wherein said polynucleotide  
2 hybridizes with the sequence as set forth in SEQ ID NO: 11 or its complement.

1 62. An isolated *Amsacta moorei* entomopox virus protein selected from the  
2 group consisting of triacylglyceride lipase, Cu<sup>++</sup>/Zn<sup>++</sup> superoxide dismutase, CPD

3 photolyase, baculovirus-like inhibitor of apoptosis, first poly(A) polymerase small  
4 subunit, second poly(A) polymerase small subunit, first DNA polymerase, second  
5 DNA polymerase, ABC transporter-like protein, Kunitz-motif protease inhibitor and  
6 poly(A) polymerase large subunit.

Sub 14  
1 63. The triacylglyceride lipase of claim 62 comprising the amino acid  
2 sequence as set forth in SEQ ID NO: 12, or a fragment or variant thereof.

1 64. The  $\text{Cu}^{++}/\text{Zn}^{++}$  superoxide dismutase of claim 62 comprising the amino  
2 acid sequence as set forth in SEQ ID NO: 13, or a fragment or variant thereof.

1 65. The CPD photolyase of claim 62 comprising the amino acid sequence as  
2 set forth in SEQ ID NO: 14, or a fragment or variant thereof.

1 66. The baculovirus-like inhibitor of apoptosis of claim 62 comprising the  
2 amino acid sequence as set forth in SEQ ID NO: 15, or a fragment or variant thereof.

1 67. The first poly(A) polymerase small subunit of claim 62 comprising the  
2 amino acid sequence as set forth in SEQ ID NO: 16, or a fragment or variant thereof.

1 68. The second poly(A) polymerase small subunit of claim 62 comprising the  
2 amino acid sequence as set forth in SEQ ID NO: 17, or a fragment or variant thereof.

1 69. The first DNA polymerase of claim 62 comprising the amino acid  
2 sequence as set forth in SEQ ID NO: 18, or a fragment or variant thereof.

1 70. The second DNA polymerase of claim 62 comprising the amino acid  
2 sequence as set forth in SEQ ID NO: 19, or a fragment or variant thereof.



1           71. The ABC transporter-like protein of claim 62 comprising the amino acid  
2 sequence as set forth in SEQ ID NO: 20, or a fragment or variant thereof.

1           72. The Kunitz-motif protease inhibitor of claim 62 comprising the amino  
2 acid sequence as set forth in SEQ ID NO: 21, or a fragment or variant thereof.

1           73. The poly(A) polymerase large subunit of claim 62 comprising the amino  
2 acid sequence as set forth in SEQ ID NO: 22, or a fragment or variant thereof.

1           74. An isolated polynucleotide encoding an *Amsacta moorei* entomopox  
2 virus polypeptide, wherein said polynucleotide is selected from the group consisting  
3 of AMVITR10, AMV002, AMV047, AMV051, AMV054, AMV059, AMV061,  
4 AMV066, AMV078, AMV079, AMV081, AMV084, AMV087, AMV91, AMV093,  
5 AMV105, AMV114, AMV122, AMV135, AMV139, AMV147, AMV150,  
6 AMV153, AMV166, AMV167, AMV174, AMV181, AMV192, AMV193,  
7 AMV197, AMV199, AMV205, AMV221, AMV228, AMV230, AMV231,  
8 AMV234, AMV246, AMV248 and AMV256, or a fragment or variant thereof.

1           75. An isolated *Amsacta moorei* entomopox virus polypeptide encoded by  
2 a polynucleotide selected from the group consisting of AMVITR10, AMV002,  
3 AMV047, AMV051, AMV054, AMV059, AMV061, AMV066, AMV078,  
4 AMV079, AMV081, AMV084, AMV087, AMV91, AMV093, AMV105, AMV114,  
5 AMV122, AMV135, AMV139, AMV147, AMV150, AMV153, AMV166,  
6 AMV167, AMV174, AMV181, AMV192, AMV193, AMV197, AMV199,  
7 AMV205, AMV221, AMV228, AMV230, AMV231, AMV234, AMV246, AMV248  
8 and AMV256, or a fragment or variant thereof.